



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

QUALIFICATION : BACHELOR OF COMPUTER SCIENCE	
QUALIFICATION CODE: 07BACS	LEVEL: 7
COURSE: ADVANCED PROGRAMMING	COURSE CODE: APG710S
DATE: JULY 2019	PAPER: THEORY
DURATION: 3 Hours	MARKS: 100

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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THIS QUESTION PAPER CONSISTS OF 2 PAGES

(Excluding this front page)

INSTRUCTIONS

1. Answer ALL the questions on the answer scripts.
2. Write clearly and neatly.
3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Calculator.

SECTION B (50 Marks)

1. Create a class called Circle which contains: [14 Marks]
 - a. Two private data members(variables):radius(of type double) and color.[1 mark]
 - b. A parametised constructor [2 marks]
 - c. A destructor [1 mark]
 - d. A copy constructor [3 marks]
 - e. A stand alone friend function called getArea. This function takes in a a class object of type Circle and its implementation should be outside the class Circle. The function should calculate and the return the area of the passed object. [5 marks]
 - f. Create one object of type circle in the main method and the function call getArea function. [2 Marks]

2. Create a function called **nameLength()** which takes one string parameters by reference. The string parameters represents a student's name. The nameLength() function should only allows the user to print out the student name to the screen if the length of the name is less than 10.If the length of the name is out of range throw a user defined OutOfRangeException. NB: Include the try and catch block to handle the exception thrown in the main function.
[10 Marks]

3. Create and initialize a string array of size 5 called **Names** and a pointer to the created array[2 Marks]
 - a) Print out the memory address of each element in the created array. [2]
 - b) Print out each array element's values using the created pointer. [2][6 Marks]

4. Create a function template called **Swap** that's allows you to swap the values of any two variables, of any type, as long as the two variables have the same type. Further Create a full template specialization for the string type that returns the two concatenated strings. Test you two function template variation in the main by invoking them and print out the results to the screen. [10 marks]

5. Create a function that takes in a text file called "numbers.txt" and a user input array of type int of size 10.The function should write all the even numbers to the file from the array. The function call should be demonstrated in the main function.[10 marks]

****End of Examination****